## Contents

| Preface   | vii |
|---|-----|
| Qualitative Study of the Parabolic Collision Restricted Three-body Problem JOSEP M. CORS AND JAUME LLIBRE | 1   |
| Singularities in the Newtonian $n$ -body Problem Donald G. Saari and Zhihong Xia                          | 21  |
| A Variational Approach to Multibump Solutions of Differential Equations Paul H. Rabinowitz                | 31  |
| Melnikov Method for Autonomous Hamiltonians<br>Clark Robinson   | 45  |
| Exponentially Small Transversality in the Rapidly Forced Pendulum<br>NYAYAPATI PREM KUMAR SWAMI           | 55  |
| The Collinear One-bumper Two-body Problem SAMUEL R. KAPLAN  | 87  |
| Limiting Mass Distributions of Minimal Potential Central Configurations Peter W. Lindstrom                | 109 |
| The Symmetric Central Configurations of Four Equal Masses ALAIN ALBOUY                                    | 131 |
| Central Configurations in the Charged Three Body Problem  |     |
| ERNESTO PEREZ-CHAVELA, DONALD G. SAARI, ANTONI SUSIN, AND ZHIMING YAN                                     | 137 |
| Reduction in the Rotating Kepler Problem and Related Topics MARTIN KUMMER                                 | 155 |
| Asymptotic Behavior of Escape Solutions of Mechanical Systems with Polynomial Potentials                  |     |
| Manuel Falconi and Ernesto A. Lacomba   | 181 |
| More on the Heteroclinic Orbits for the Monotone Twist Maps   |     |
| Qiudong Wang  | 197 |

vi CONTENTS

| Transition Maps of Homoclinic Orbits and Resonances near Bifurcations of Circle Maps   |     |
|--|-----|
| TODD R. YOUNG  | 207 |
| Resonance Transition and Instabilities; A Numerical Study of the Restricted<br>Three-body Problem  |     |
| XINHAO LIAO, DONALD G. SAARI, AND ZHIHONG XIA  | 219 |
| Directions of Hamiltonian Dynamics and Celestial Mechanics SAMUEL R. KAPLAN, RICHARD CUSHMAN, SEN HU, JAUME LLIBRE, CHRISTOPHER MCCORD, DONALD G. SAARI, AND ZHIHONG XIA | 229 |